Returning disability pensioners with back pain to work

Liv Heide Magnussen

Dissertation for the degree philosophiae doctor (PhD)

at the University of Bergen, Norway

2007

Returning disability pensioners with back pain to work

Liv Heide Magnussen

Department of Education and Health Promotion

Faculty of Psychology

University of Bergen, Norway

2006

- Though he had begun to wonder, after a certain period of not working, if you couldn't simply forget *how* to work, forget the particulars, lose the reasons for it. And once that happened, it could become possible never to hold another job as long as you lived.

From Richard Ford: Rock Springs

Acknowledgements

This work was primarily carried out at the Unifob Department of Health, University Research Bergen and the Norwegian Back Pain Network- the Research Unit. The process leading to this doctoral thesis has been challenging and enriching. I want to express my sincere gratitude to many persons and institutions.

- First to all the disability pensioners who willingly have participated in the project. This thesis rests upon their participation.

- To all my co-workers at the Department of Biological and Medical Psychology for creating such an inspiring, supporting and nice place to work. Special thank to Vivian Fosse who keeps track on everything, always with a smile and a solution, to Linda Sandal for her technical assistance, to Nina Konglevoll for taking care of the data, to Erling Svensen for being such a great person to share office with, and for taking care of the motivation course in the intervention, to Torill Tveito for always being so helpful and friendly, to Hilde Gundersen for valuable help with EndNote, to Eli Nordeide, Randi Espelid, Anne Marita Milde and Ingrid Orre for being such nice colleagues. I will miss the joyful discussions and good laughs with you all.

- To my primary supervisor and co-author Hege Randi Eriksen for sharing her profound research knowledge and experience with me, for providing me with challenges and opportunities enhancing my development. Her constructive criticism combined with encouragement and trust has kept me going. With an admirable ease she always saw the actual problem and could suggest a solution.

- To Liv Inger Strand who has been my second supervisor and co-author, and also supervised me in the master study in physiotherapy, and who has become a good friend and colleague. I am deeply grateful for having a share in her extensive knowledge, especially regarding development and validation of

physical performance tests, and for all the time and effort she has put into this work. Her thoughtfulness and encouragement has helped me immensely during this process.

- To Jan Sture Skouen, my third supervisor and co-author. His valuable clinical and research experience in this field has been a great help and inspiration. He was in charge of the intervention programme. Thank you for your valuable contribution and support.

- To Holger Ursin for his valuable comments and feedback on this work. It has been a pleasure to have had the opportunity to discuss this work with such a knowledgeable person.

- To Målfrid Råheim, co-author and supervisor in the qualitative part of the project. I will remember our inspiring and nice breakfast meetings.

- To my colleagues at the Section for Physiotherapy Science for their generosity and supporting attitude, and for showing interest in my field of work. Very special thanks go to Professor Anne Elisabeth Ljunggren who invited me into the project in the first place. It has been a pleasure to be included into such an inspiring and friendly environment.

- To the Department of Physiotherapy at the Bergen University College which is my present work place, and where I have been given opportunity to finish this thesis. Thanks to all my colleagues at the department for their always friendly support and interest which have been valuable in the final stage. A special thank goes to my good friend and colleague Grethe A. Indredavik who contributed in the physical testing, and to Hildegunn Lygren for co-operating in validation of the physical tests and for interesting discussions.

- To the skilled staff at the Outpatient Spine Clinic at Haukeland University Hospital for conducting the intervention programme: Kjersti Sem Ringel for

organising it all and Eirik Vikane and Thomas Kadar for medical examination of the participants.

- To Gunn Marit Strisland and Svein Erik Tønnesen at the Regional Insurance Administration for valuable assistance in organizing the study, and to Tove Solberg at the Work Office and Bertil Søfteland at the Social Security Office for giving valuable support in the intervention programme.

- To Stein Atle Lie and Stein Emil Voldset for valuable advice with the statistics.

- To my friend Inger Solheim for her encouragement and never ending support. Our great discussions of subjects and life have contributed tremendously to the whole process.

- My deeply felt gratitude go to family and friends for their interest, support and concern. I am so lucky being related to you all. A loving thanks to my three children Vegard, Gunnhild and Jonas for love and encouragement and for accepting to have a distracted mother for long periods of time. Loving thanks also to Marit and to my wonderful grandson Elias, who has added joy and sunshine to life.

- Finally, I want to give a very special attention to you, Stein, my husband and best friend. You have provided every sort of support throughout these years. Even late at nights you have been willing to discuss disability topics. Not only have you been thoughtful, patient, caring, but also co-author and my best critic. Without you I could never have accomplished this work.

This research project was funded by the Norwegian Foundation for Health and Rehabilitation through the Norwegian Back Pain Organization (Ryggforeningen).

Bergen, September 2006

Liv Heide Magnussen

Preface

After finishing my education at the College for Physiotherapy in Bergen in 1979, I did clinical work for many years. A lot of experience was derived from rehabilitation efforts of individual patients with long standing back pain, and I found this work both challenging and difficult. In 1999, I finished my Master degree at the Department of Public Health and Primary Health Care, University of Bergen, and my master thesis concerned physical performance tests used in back pain research. Through this study my interest for back pain research grew. Therefore, I was delighted to be invited to join in a research project related to the challenge of helping disability pensioners with long-lasting back pain to return to work. The project started in 2003 by funding from the Norwegian Foundation for Health and Rehabilitation, and "stood upon the shoulders" of a great tradition of back pain rehabilitation research carried out in Bergen during the last 10 years and I have been privileged to be supervised and inspired by many local experts in this field. The enigma of an increasing number of disability pensioners and a shortage of work force seem to be one of today's great challenges, and has felt like an additional inspiration.

Bergen September 2006

Liv Heide Magnussen

Abstract

The main purpose of this thesis was to investigate whether a group of disability pensioners with back pain would have a potential for a successful return to work. Perceived barriers against work, physical and mental functioning and the effect of a vocational- oriented intervention were evaluated.

The thesis consists of three papers. The first paper deals with the pensioners' perceived barriers against work and perceptions of their own health. This was considered likely to have an impact on the process of returning to work. To explore these perceptions, focus group interviews in a sample of 17 disability pensioners were carried out. Several perceived barriers against a successful return to work appeared: earlier negative experiences related to the disability process and previous work, poor self - judgement of work ability, low self-esteem, lack of support from social security authorities and unsuitable economic arrangements.

The second paper explores whether the level of physical and mental functioning would influence on a successful return to work in patients on disability pension due to back pain. Both self-report and physical performance measures disclosed considerably reduced physical functioning among these disability pensioners. High levels of pain, fear avoidance beliefs, emotional distress and other health complaints were also reported. The majority rated their working ability as poor and did not

expect that they could ever return to work. However, a subgroup with a more positive expectancy was found. In this group we found a better physical and mental functioning.

In the third paper, a randomised controlled trial was conducted to evaluate the effect of a brief vocational-oriented intervention. The intervention focused on the issues emerging from Paper 1 and 2. The intervention had no statistically significant effect on return to work during the following year. However, twice as many in the intervention group as in the control group had entered into a return to work process at 1-year follow-up which gave a number needed to treat of 9. Prognostic factors for having entered this process included a more positive expectancy for a return to work, less pain and better physical performance.

This thesis confirms that the effort of returning disability pensioners with back pain to work is a challenging task. Due to the large economical implication of returning disability pensioners to work, the modest effect of the intervention used in the present study may still be of clinical and economical relevance, at least for a selected group of pensioners. Candidates for vocational rehabilitation seem to be more likely to succeed if they have a positive attitude towards returning to work, have less pain and when they are not severely physically impaired. Candidates in future rehabilitation

programmes should probably be selected based on these criteria. They seem also to need very close follow-up from all parts involved in the return to work process.

List of publications

Paper 1 Magnussen L, Nilsen S, Raaheim M: “Barriers against returning to work - as perceived by disability pensioners with back pain - a focus group based qualitative study”. Accepted for publication in Disability and Rehabilitation, May, 2006

Paper 2 Magnussen L, Strand LI, Eriksen HR: “Physical and mental functioning in disability pensioners with back pain”. Submitted (revised) to Journal of Musculoskeletal Pain

Paper 3 Magnussen L, Strand LI, Skouen JS, Eriksen HR: Motivating disability pensioners with back pain to return to work – A randomized controlled trial”. Accepted for publication in Journal of Rehabilitation Medicine, May 2006.

Abbrevations

DP	Disability Pension
NIA	National Insurance Administration
RIA	Regional Insurance Administration
LBP	Low Back Pain
NOK	Norwegian Kroner
GDP	Great Domestic Product
OECD	Organisation for Economic Co-operation and Development
NOU	Norske Offentlige Utredninger (Nowegian Public Reports)
ICF	International Classification of Functioning, Disability and Health
WHO	World Health Organisation
NNT	Number Needed to Treat

Contents

1. Introduction

1.1 The problem

Musculoskeletal complaints are one of the most common reason for short-term sick leave (Bruusgaard & Brage, 2001), and for sick leave lasting more than 2 weeks (NIA, 2005). One third of all disability pensions (DP) is due to disorders in the musculoskeletal system (NIA, 2005). Among disability pensioners, low back pain (LBP) is the most frequent condition (Brage, 2000), alone leading to 13-17% of all sick leave and DP (Brage & Reiso, 1999). LBP has generally a benign course as most of those affected recover within a few weeks (Frank et al., 1996). However, some will develop chronic pain and disability which in turn may lead to absence from work and isolation from social life. Prolonged unemployment is associated with poorer physical and mental health (Acheson, 1998; Janlert, 1997; Waddell, 2004a) and lower life expectancy (Morris et al., 1994; Nylen et al., 2001; Voss et al., 2004). For those individuals, LBP has serious impact on quality of life.

Long-term sick-leave, vocational rehabilitation and disability pensions due to back pain also represent an economical burden for the society. DP alone had a cost of more than 44 billion NOK, which is about 5.6 % of the Norwegian Gross Domestic Product (GPD) in 2004. There is an increasing concern in Norway as well as in other

Western countries about the ever increasing number of disability pensioners falling out of work before the time of retirement (Figure 1).

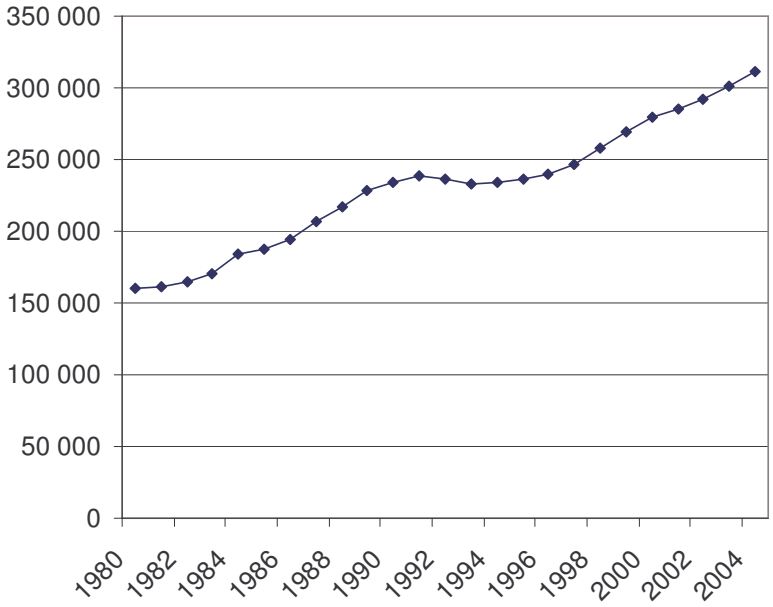

Figure 1. Stock of disability pensioners in Norway from 31.12.80 to 31.12.04

In the years to come, a decreasing number of employees will have to carry the increasing expenses of the pensions, to a point where these costs will no longer be possible to fulfil after the year of 2050 (Glad, 2003). The government has through different initiatives tried to curb this development, so far with minimal effect. Steps have been taken to increase the age of retirement, which today is less than 60 years in average. It is also a goal to include a higher number of unemployed and disability pensioners in working life (Glad, 2003). The present doctoral thesis explores the possibility of including a higher number of disability pensioners in working life.

1.2 The Norwegian disability pension (DP)

In Norway, a DP can be granted if the work ability for any gainful work, or income for work, is permanently reduced by at least 50% because of disease, injury or inborn defect. All appropriate medical treatments and vocational rehabilitation should have been tried out (NIA, 2005). A new reform, a "time-limited DP", was introduced in 2004, meant for persons with a potential for returning to work after a limited period of time. These disability pensioners are scheduled to be re-examined after 1-4 years to evaluate if work ability has improved. Assessment of physical and mental functioning will be of great importance in these cases. Despite different initiatives to reach consensus concerning functional assessments, no standard procedure or criteria have been agreed upon for this evaluation (Engebers & Veiersted, 2003).

1.3 Change in the Norwegian DP over time

In Norway, the incidence of DP started to increase in the early 1980s after a stable period in the 1970s (Krokstad et al., 2002b; NOU, 2000). The increase in DP stock occurred despite increased health and life expectancy in the population. The annual incidence of disability pensioners has fluctuated from around 20 000 in 1980 to 30 000 in 2004, with a marked fall in 1993 (Figure 2). In 1991 a comprehensive benefit reform (stricter medical criteria, tougher regional and occupational mobility requirements) was passed, aiming to limit the access to DP. The inflow rate declined in the following years by as much as 20-30%, before a new increase took place from 1994-95 (Krokstad et al., 2002b; NOU, 2000).

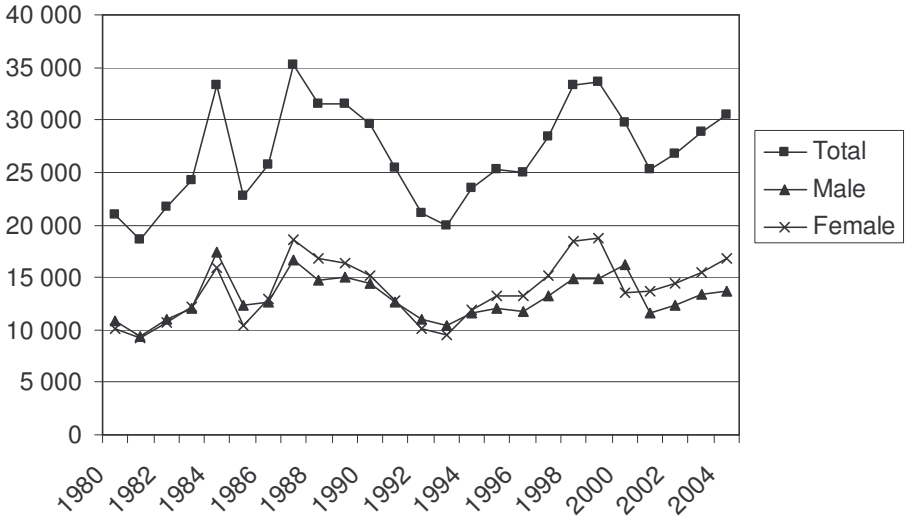

Figure 2. Yearly inflow of disability pensioners from 31.12.80 to 31.12 04 (NIA, 2005)

The same pattern is reflected in the annual incidence of back pain disability pensioners (Figure 3). From 1989 until 1993 there was a marked decrease in the yearly inflow, but after 1993 the rate started to increase again. Thus, despite the fact that the legalisation is based on medical criteria, it is good reason to believe that other factors than disease, injury or inborn defect play a part in the granting of DP (Hagen et al., 2000).

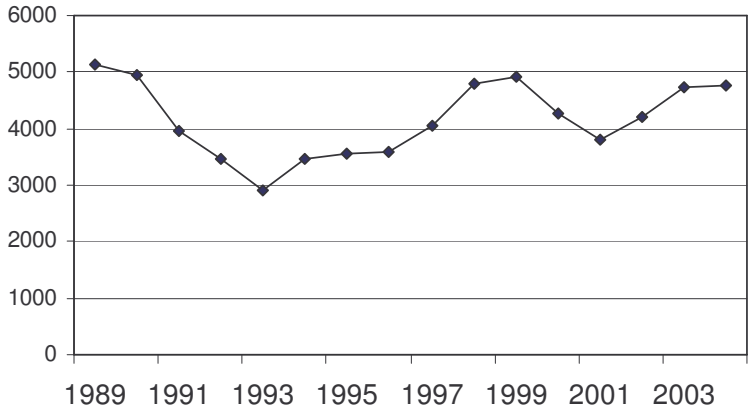

Figure 3. Yearly inflow of disability pensioners with back pain from 1989 to 2004 (NIA, 2005)

A strong relationship has been found between low socioeconomic status and incidence of DP (Guberan & Usel, 1998; Mansson et al., 1998). Increasing unemployment has been used to explain the increase in DP in the late eighties (Krokstad et al., 2002a; NOU, 2000). However, a new increase in DP inflow took place a few years later even if the unemployment rate at that time was low. An increased number of individuals not returning to work after rehabilitation (Claussen & Bjerkedal, 1999), a higher employment rate among women and the increased birth rate after the Second World War, may explain this increase (Hagen et al., 2000). When the unemployment rate is low, as is presently the situation in Norway, the health related absence from work is likely to increase. Changes in social structure during the last 20 years with increased demands on educational levels, skills, productivity and mobility may also have lead to increased health-related exclusion from work (Hansson et al., 2001).

In 2001, the Norwegian Government together with labour and employer organisations reached an agreement to make a joint effort to reduce sick leave, actively include individuals with disabilities into working life, and to increase the actual age of retirement (Including working life, 2001). Several economic incentives have been introduced in connection with this agreement.

1.4 Comparisons to other countries

Since the social insurance schemes in the Western countries are not identical, it is often difficult to compare statistical information (OECD, 2003, Krokstad et al. 2004). Even between the Nordic countries the social insurance schemes differ (Brage et al., 2002). The number of disability pensioners in the Nordic countries is high compared to most other European countries (NOU, 2000, OECD, 2003). Countries with high benefit levels tend to have high prevalence of disability pensioners. Recently, countries with lower benefit levels have had equally high rates of inflow, and the rates of outflow are also similar. Comparisons between countries do not support the impression that high or increasing unemployment rates lead to increased rates of disability pensioners (OECD, 2003). At the same time, there is some indication that a stricter access to disability benefits results in somewhat higher unemployment level. In most countries, the costs of disability benefit in percentage of GDP have increased from 1990 to 1999, although with considerable differences between countries (Table 1).

Table 1. Public expenditure on disability benefit (OECD, 2003)

	Percent of Great Domestic Product (GDP)	
	1990	1999
Norway	2.23	2.36
Sweden	2.03	2.05
Denmark	2.31	2.28
United Kingdom	0.88	1.27
Netherlands	3.42	2.65
OECD (mean)	1.22	1.30

Compared to all other OECD countries, Norway has the highest expenditure in all disability- related programmes (Table 2). The steady increase in number of individuals receiving DP in general calls for vigorous efforts seeking to reverse this trend.

Table 2. Public expenditure of disability-related programmes* in different countries (OECD, 2003)

	Percent of Great Domestic Product (GDP)
	1999
Norway	5.58
Sweden	4.66
Denmark	3.80
United Kingdom	1.54
Netherlands	4.64
OECD (mean)	2.42

*Disability benefits, sickness cash benefits, work injury benefits and employment-related programmes for disabled persons

1.5 Low back pain (LBP)

According to the European Guidelines for prevention of low back pain (Burton et al., 2006), LBP is defined as pain and discomfort, localised below the costal margin and above the inferior gluteal folds, with or without leg pain, and is often divided into specific (10-20%) and non-specific (80-90%) LBP. Most back pain is non-specific

(common), defined as pain not attributed to recognisable, known specific pathology (e.g. infection, tumour, osteoporosis, ankylosing spondylitis, fracture, inflammatory process, radicular syndrome or cauda equina syndrome). Acute back pain is usually considered self-limiting as 90% of cases tend to recover within 6 weeks, while 2-7% develop chronic pain (Burton et al., 2006). Physical problems are often considered as most important in the acute stage (<4 weeks), while psychosocial issues become increasingly important in the chronic stage (> 12 weeks) with implications for the individual's daily life, family and work (Airaksinen et al., 2006).

Many factors seem to influence the development of disability in chronic back pain. A widespread musculoskeletal pain pattern, rather than a localized one, has been found to predict long-term work incapacity (Natvig et al., 2002). Individuals who develop chronic pain and long-term disability often have other complaints as well (Hagen et al., 2006; Hagen et al., 2002; Hestbaek et al., 2003, Von Korff et al., 2005). Sensitisation has been suggested to be the underlying mechanism for co-morbidity (Eriksen & Ursin, 2004). Sensitisation is an increased reactivity to stimuli (pain) caused by repeated use. Increased sensitivity has been documented to be associated with chronic LBP (Clauw et al., 1999) and fibromyalgia (Vaeroy et al., 1988). Individuals at high risk for future DP due to back pain are likely to perceive their work as physically demanding, have lower education and feel tired and worn out (Hagen et al., 2002).

Because disability related to chronic LBP is multicausal and complex, vocational rehabilitation should focus on different aspects, including the individuals' reaction to pain, and on their worries of how the pain will affect their health and work. People with chronic pain often feel that the pain controls them (Adams, 1997). When encouraging disability pensioners to increase their activities of daily living and start taking part in work activities, it is important to teach them to understand how they can regain control over their own situation. They also need proper information and reassurance that pain is not dangerous.

2. Functioning and work ability

2.1 Functioning

To explore the relationship between work-status and functioning of patients with chronic LBP, the International Classification of functioning, disability and health (ICF) can be useful (WHO, 2001).

2.1.1 International classification of functioning, disability and health (ICF)

The ICF consists of two parts. One part includes the components body structure and body function, activity and participation. These dimensions can be described according to functioning (positive aspects) and disability (negative aspects). The second part includes personal and environmental factors. Functioning and disability are conceived as a dynamic interaction with the personal and environmental factors in a health perspective (WHO, 2001).

Body function and structure

Body function is related to physiological and psychological functions of body systems, like functions of the respiratory system, functions of the joints and bones or mental functions, impairments are related to significant deviation or loss within these systems. Individuals with chronic LBP may have reduced physical fitness (Brady et al., 1994; Fryer et al., 2004; Trainor & Trainor, 2004; Verbunt et al., 2005; Smeets et al., 2006) and they may experience pain (van den Hoogen et al., 1997; Waddell,

2004d). Disuse may result in deconditioning and deterioration of the musculoskeletal, cardiovascular, and central nervous systems and may also lead to obesity and depression (Bortz, 1984; Mayer & Gatchel, 1988).

Activity

Activity is described as execution of a task or action by an individual, and activity limitations are the difficulties an individual may have in executing tasks or actions. Patients with chronic LBP may be limited in performing activities of daily living such as self-care, dressing or performing household tasks or in work-related activities, such as carrying, moving, and handling objects (Roland & Morris, 1983; Kohlmann & Raspe, 1994; Simmonds et al., 1998; Mackenbach et al., 2001; Strand et al., 2002; Brage et al., 2004; Grotle et al., 2005).

Participation

Participation is described as involvement in life situations, the societal perspective of functioning. Participation restrictions are difficulties an individual may experience in involvement in life situations. Patients with chronic LBP may be restricted in sports activities or social life (Lötters et al., 2003; van den Hoogen et al., 1997), or in participation at work (Hoogendoorn et al., 2000; Picavet & Schuit, 2003).

Environmental factors

Environmental factors refer to the physical, social and attitudinal factors making up the environment in which people live and conduct their lives. Examples of such factors are other people in different relationships and roles, attitudes and values,

social systems and services, and policies, rules and laws. In patients with chronic LBP, marital status (Mackenbach et al., 2001; Steenstra et al., 2005), and social insurance litigation (Watson et al., 1998; Pearce, 2000; Waddell, 2002b) may influence disability or functioning. The availability of modified work places, adjustment latitude, and rigidity of rules of employment, lack of suitable policies, downsizing and distance from the labour market are other factors which may influence disability or functioning in disability pensioners with LBP (Watson et al., 2004).

Personal factors

Personal factors refer to the particular background of an individual's life and living. In patients with chronic LBP, age (Hagen & Thune, 1998), gender (Hansson & Jensen, 2004; Steenstra et al., 2005), educational level (Hagen & Thune, 1998; Mansson et al., 1998; Krokstad & Westin, 2004; Gjesdal et al., 2004), depression (Linton, 2000; Pincus et al., 2002), fear of movement (Crombez et al., 1999; Vlaeyen & Linton, 2000), self-efficacy (Cole et al., 2002; Schultz et al., 2002), coping (Pincus et al., 2002; van der Hulst et al., 2005), pain cognition (Lackner & Carosella, 1999) and self-esteem (Waddell, 2004c) are personal factors which may influence disability and functioning.

2.2 Work ability

There is no definition, universally agreed upon, of basic requirements for work ability. The complex issue of work ability is addressed by organizations like WHO

and EU as: “Individuals’ work ability is based on their physical, psychological and social capacity and professional competence, the work itself, the work environment, and the work organization” (Thomas, 2002). Ilmarinen and Rantanen (1999) state that factors that influence work ability make a complex relationship between environmental factors like work, values, competence, and health and social relations. Work ability probably determines whether people with longstanding health problems are able to return to work. Self-assessed work ability has been shown to predict return to work in patients on sick leave due to musculoskeletal pain (Hagen et al., 2005; Haldorsen et al., 1998; Reiso et al., 2003). Work ability is determined by the individual health condition and by what is expected from work. Work ability is sometimes described in relation to the physical and mental demands of the job (Tuomi et al., 1994). Adjustment latitude is another way of describing work conditions and demands of the job (Johansson & Lundberg, 2004) and is defined as opportunity to adjust work to health; for instance to do other tasks, work at a slower pace or having possibilities to take unscheduled breaks (Johansson et al., 2006). When the adjustment latitude is high, it is more likely that a person regains ability to work (Johansson et al., 2006; Johansson & Lundberg, 2004). Opportunities to adjust work to the health condition may be a prerequisite for disability pensioners with LBP to succeed in returning to work.

3. Barriers

3.1 Barriers against returning to work in disability pensioners

Disability pensioners with back pain face a number of problems if they consider a return to work (Thornton, 1998; Waddell, 2004a). They may have become progressively less fit through inactivity (Mayer & Gatchel, 1988; Smeets et al., 2006), their vocational skills may be outdated because they have been out of work for years, suitable adjusted work may be difficult to find, there may be prejudice from employers and they may have problem of accessing vocational-rehabilitation programmes which are often designed for employed persons on sick leave (Watson et al., 2004). Recently, the Norwegian National Insurance Administration carried out a project, interviewing disability pensioners about the prospect of a return to work (Olsen et al., 2005). Three risk factors for not returning to work were pointed out: worries about own future health, concerns about coping ability with working life, and economical concerns. Worries about own health was the most frequently reported reason for not being able to return to work. Among those who succeeded in returning, own motivation or having a “fighting spirit”, and economic incentives were pointed out as important factors for success.

3.2 Prognostic factors for not returning to work after sick leave

Previous studies concerning prognosis for not returning to work have pointed to a number of possible factors. They include psychological factors such as distress and fear avoidance beliefs (Gatchel & Gardea, 1999, Pincus et al., 2002, Fritz & George 2002, Crombez et al. 1999), personal aspects such as high level of pain (Shaw et al. 2001, Strand et al. 2001; Lötters & Burdorff, 2006) and work related factors such as low job satisfaction (Linton 2000; van der Giezen et al., 2000; Hansson & Jensen, 2004). Social and economical issues are also found to be of importance (Linton, 2000; McIntosh et al., 2000; Pincus et al., 2002). In a systematic review by Steenstra et al. (2005), specific LBP, higher disability levels, older age, female gender, more social dysfunction and isolation, heavier work and receiving higher compensation were identified as prognostic factors for longer duration of sick leave, while job satisfaction, a history of back pain and level of education did not seem to influence duration of sick leave. Thus, the factors found have been manyfaceted and consistent with the impression that chronic LBP is a multicausal phenomenon.

Main and Burton (2000) stated that obstacles or barriers generally related to failure to return to work are associated with the person's perceptions and concerns of health and work: demands at work, social support, self-perception of work ability (Haldorsen et al., 1998; Haldorsen et al., 1998a; Reiso et al., 2003), and fear avoidance beliefs and low expectations about return to work (Cole et al., 2002;

Marhold et al., 2002; Waddell, 2004a). Thus, rehabilitation efforts should pay close attention to the barriers of return to work as perceived by the disability pensioners themselves, and address these issues specifically in the vocational rehabilitation programmes.

3.3 Expectancy

Patient beliefs and expectations regarding recovery and return to work is found to be a very important prognostic factor for recovery and return to work (Lackner & Carosella, 1999; Mondloch et al., 2001; Cole et al., 2002; Schultz et al., 2002; Boersma & Linton, 2006). Positive expectancy of recovery is associated with better health outcomes in many different conditions including chronic pain (Mondloch et al., 2001). Worker recovery expectations have been found to influence time to return to work, as measured through suspension of time loss benefits (Cole et al., 2002; Gross & Battie, 2005).

Bandura's concept of self-efficacy (Bandura, 1977) has been a common theoretical framework used to explain relationships between beliefs and outcome. Self-efficacy refers to an individuals belief in own ability to achieve a specific goal (Lackner & Carosella, 1999). The effect of expectancy can also be explained with the cognitive activation theory of stress (CATS) (Eriksen & Ursin, 2004; Ursin & Eriksen, 2004). The challenge or stress facing an individual is evaluated based on the expectancies connected to the situation and to the possible acts available to the individual. These

possible acts depend on previous experiences and learning. In CATS, learning is defined as acquisitioned stimulus expectancy or response outcome expectancy. Previous success produces positive response outcome expectancy, and lack of success produces expectancy of failure. Coping is defined as positive outcome expectancy. When the individual learns that there is no relationship between acts and results, this may lead to a feeling of helplessness. When the individual learns that the acts lead to failure, this leads to a feeling of hopelessness. Many disability pensioners have previous experiences of failure in their efforts of returning to work, and this may have lead to negative outcome expectancy and a feeling of hopelessness when considering a return to work. Theories of sensitization support this hypothesis (Eriksen & Ursin, 2004). Disability pensioners with back pain probably have a long history of pain, and unpredictable and strong pain may have lead to learned helplessness and hopelessness (Overmier, 2002), as their actions to alleviate the pain have been unsuccessful and unpredictable.

3.4 Fear avoidance beliefs

The fear avoidance model provides a cognitive behavioural framework when describing patients with high levels of pain-related fear and gives an explanation of the mechanism whereby back pain patients may develop persistent disability (Waddell et al. 1993, Vlaeyen et al. 1995). In this model catastrophic appraisal of the pain experience is emphasised, which in turn lead to fear and hypervigilance. Another implication is activity avoidance, largely caused by fear that activity will lead to injury and will exacerbate the pain problem (Vlaeyen & Linton, 2000). When patients

have a catastrophic appraisal of their pain and believe that their pain signifies harm, it is expected that they would also have a negative outlook regarding recovery. This also fits into the theories of expectancy. Negative expectancy of recovery and a belief that activity may result in increased pain has been found to be strongly related (Boersma & Linton, 2006).

There is evidence that anxious persons have a cognitive processing priority for information that is related to their fears (Brosschot, 2002). Anxious persons will detect fear-related information earlier than non-anxious persons. Persons suffering from medically unexplained somatic complaints, like chronic musculoskeletal complaints, spend a lot of time worrying over their condition.

4. Return to work

4.1 Return to work in disability pensioners

Studies concerning return to work in disability pensioners with back pain have been scarce until now. An exception is the study of Watson et al. (2004) where the effect of a vocational-oriented rehabilitation programme was investigated. Enrolled in their study were unemployed individuals who reported they were unable to access work because of LBP. The programme consisted of psychological, physiotherapeutic and vocational focusing for 12 half days over 6 weeks with up to 3 hours of additional individual vocational counselling. All parts of the programme exclusively focused on achieving and retaining employment. In this study, nearly 40% of those enrolled eventually became re-employed in the course of 6 weeks. However, the study did not include a control group, making general conclusions uncertain.

In 2003, NIA interviewed 23 000 disability pensioners about the prospect of a return to work (Kvåle et al., 2005). Of these, 10 300 (46%) expressed motivation for trying. However, the report did not give a specific account of the factual outcome, but concluded that the observation period had been to short to demonstrate cost-effectiveness.

4.2 Return to work in patients on sick leave due to LBP

The chance of returning to work after sick leave due to LBP has been shown to steadily decrease over time, and is negligible after 1 year on sick leave (Waddell et al., 1992; Frank et al., 1996; Hagen & Thune, 1998). Once a DP is awarded, the likelihood of ever returning to work is almost zero. Within OECD, approximately 1% of the disability benefit stock leaves the rolls each year due to recovery or work resumption (OECD, 2003). Exceptions are United Kingdom and the Netherlands which have an outflow rate of 5% and 3 % respectively. The low rate of outflow is found in countries with a strong focus on avoiding inflow through vocational rehabilitation and training, like the Scandinavian countries, and in which it may be expected to be difficult to re-integrate those who are granted DP. The same tendency is seen in countries with strong focus on economic incentives to get benefit recipients off the rolls (OECD, 2003).

4.3 Vocational-oriented rehabilitation models

Traditionally, vocational rehabilitation models have focused on restoring the physical, mental and social functioning of patients to their previous condition after disease or injury (Hadler, 1996). In this bio-medical model, pain is regarded as tissue injury which leads to impairments, disability and incapacity for work (Waddell, 2004b). It is assumed that when pain alleviates, disability will also disappear. However, the relation between severity of back pain and disability in daily activities and work has been found to be low (Waddell, 2004b). In another study, improvement

in physical performance and pain was related to return to work at 1-year follow-up evaluation (Strand et al., 2001). Therefore, a more complex model is needed. Waddell and Burton (2005) have suggested that rehabilitation programmes should include health-related, personal or psychological and social or occupational dimensions according to a bio-psychosocial model. In LBP disability pensioners, social issues may be of great importance. Waddell states that the society fails to make arrangements that enable disabled patients to utilize the retaining work potential, and therefore disability have become a political rather than a medical issue (Waddell, 2004b).

There is evidence that physical exercise and appropriate education are effective in secondary prevention of LBP (Burton et al., 2006), and that exercise also has an effect on sick leave, costs and new episodes of LBP in employees (Tveito et al., 2004). There is also strong evidence that intensive bio-psychosocial rehabilitation with a functional restoration approach improves pain and function, while less intensive treatment does not show clinically relevant improvements (Guzman et al., 2001). However, disability pensioners who have been out of work for years have probably gone through several previous treatment programmes that have failed to reduce pain and disability sufficiently. Because patients not returning to work often have increased co-morbidity and emotional distress (Hagen et al., 2006; Hagen et al., 2002; Hestbaek et al., 2003, von Korff et al., 2005), in addition to lower educational level, these factors must be taken into consideration in rehabilitation efforts. It may

be important to teach the individual to manage the painful condition, and try to change how they think about the pain and their ability to work. There is evidence that cognitive intervention programmes and exercises improve function (Brox et al., 2003) and coping (Magnussen et al., 2005) in patients with chronic LBP (>1 year) considered for surgery. The cognitive intervention in these programmes consisted of lectures aiming to give the patient an understanding on how ordinary physical activity would not harm the back (reassurance) and a recommendation to use the back in a flexible way.

Both identification of obstacles against work, but also evaluation of expectancy for a return to work is of importance in vocational rehabilitation. Main and Burton (2000) stated that obstacles against work depend on the person's own perceptions and concerns about health and work. Motivation for re-employment may increase by addressing the perceived obstacles and focusing on the personal resources in the rehabilitation programme. Proper information, education and reassurance, and close co-operation with the social insurance and work offices may also be important to succeed in returning disability pensioners to work.

5. Aims of the thesis

It has been a growing concern in Norway, as well as in other Western countries, that a steadily increasing number of the working age population is relying on disability benefit as their main financial income. Low back pain is one of the single most common reasons for entitlement of DP on medical grounds. The main aim of this thesis was therefore to investigate if it was possible to bring a group of back pain disability pensioners back to work or making a positive progress of entering into a return to work process by a brief vocational-oriented intervention. The intervention built on an exploration of the pensioners' possible perceived barriers against returning to work and on an evaluation of their physical and mental functioning.

Re-employment is generally very low in individuals receiving DP (NIA, 2005; OECD, 2003). To succeed in returning disability pensioners to work, we found it important to identify possible perceived barriers against a return (Waddell & Burton, 2005). Personal perceptions of working conditions and concerns about health and work are likely to form specific obstacles against work (Marhold et al., 2002; Waddell & Burton, 2005). The first aim of this thesis was therefore to identify barriers against return to work as perceived and experienced by the pensioners themselves (Paper 1).

Back pain disability is a dynamic process that evolves over time, and the physical and mental functioning may vary. To be able to return to work a sufficient amount of work ability has to be present. However, there is no consensus regarding how to evaluate working ability. The second aim of the thesis was therefore to describe the physical and mental functioning of the participants (Paper 2).

Expectancy tend to be an important prognostic factor for returning to work, and the third aim was therefore to explore to what extent a positive expectancy for returning to work was present in this group, and to examine if there was any relationship between expectancy and factors like work-related or daily functioning, life satisfaction, pain and fear avoidance beliefs (Paper 2).

The state of receiving DP may be self perpetuating even if the underlying condition improves. Stayling out of the work market for a long time makes it difficult to re-enter. A brief vocational-oriented intervention on a voluntary basis, however, might be enough to get started again. Failure to return to work seems to be associated with the person's perceptions and concerns of health and work (Main, 2000). Therefore, these factors should be addressed in the rehabilitation. Proper information, education and reassurance in addition to focusing on the pensioners' resources may encourage them to reconsider work. Brief interventions have been shown to be superior to more comprehensive interventions in helping patients with chronic LBP back to work. The

fourth aim of this thesis was therefore to investigate if a brief vocational-oriented intervention could motivate a group of back pain disability pensioners to return to work. The fifth aim was to investigate if it was possible to identify any prognostic factors for returning to work or having entered a return to work process during the following year (Paper 3).

5.1 Research aims

The following aims of the thesis were formulated:

1. To explore the issue of perceived barriers for returning to work based on experiences and beliefs in a group of disability pensioners with back pain (Paper 1).
2. To describe physical and mental functioning of a group of disability pensioners with back pain (Paper 2).
3. To examine expectancy in the disability pensioners and the relationship between expectancy and work-related and daily functioning, life satisfaction, fear avoidance beliefs and pain (Paper 2).
4. To investigate the effect of a brief vocational-oriented intervention on returning to work (Paper 3).
5. To identify prognostic factors for having entered a return to work process at 1-year follow-up (Paper 3)

6. Methods

6.1 Subjects

Eligible for the study were all individuals receiving DP due to back pain in the county of Hordaland, Norway (n=431, 57% women). The disability pensioners were recruited through the National- (NIA) and the Regional Insurance Administration (RIA). Inclusion criteria were age from 18 to 55 years, DP for at least one year and full disability benefit payment. An information letter was sent to all individuals who fulfilled the inclusion criteria. They were invited to participate primarily to get increased knowledge about their present functional ability and health status, and secondly to help those who were motivated to return to work. Of the invited pensioners, 21% (n=89) volunteered for the study. Mean age was 49 years, and 65% were women.

All of the 89 included individuals participated in study 2 (Paper 2), and seventeen of them (70.6% women) were invited to participate in the focus group interview (paper 1). The 17 participants in the focus groups were selected for strategic reasons to include a broad range of characteristics like age, gender and number of years receiving DP. At 1-year follow-up, 79 individuals took part in study 3 (Paper 3). Further information of demographic variables of those who participated in the study and those who did not are described in the separate Papers 1-3.

The study was performed according to the Helsinki Declaration, and was approved by the Regional Ethics Committee and the National Data Inspectorate in Norway.

6.2 Study designs

Several study designs have been used in this thesis (see Figure 4). In Paper 1 a qualitative design based on three focus group interviews was used to investigate barriers against returning to work as perceived by the disability pensioners themselves. In Paper 2 a cross-sectional design based on questionnaires and physical testing was used to examine the physical and mental functioning in the participants. Expectancy for return to work was examined, and possible factors related to having a negative expectancy were analysed. In Paper 3 a randomised controlled trial (RCT) evaluating the effect of a brief vocational-oriented intervention was used. The participants were randomized to receive a vocational-oriented rehabilitation programme (n=45) or a to control group (n=44).

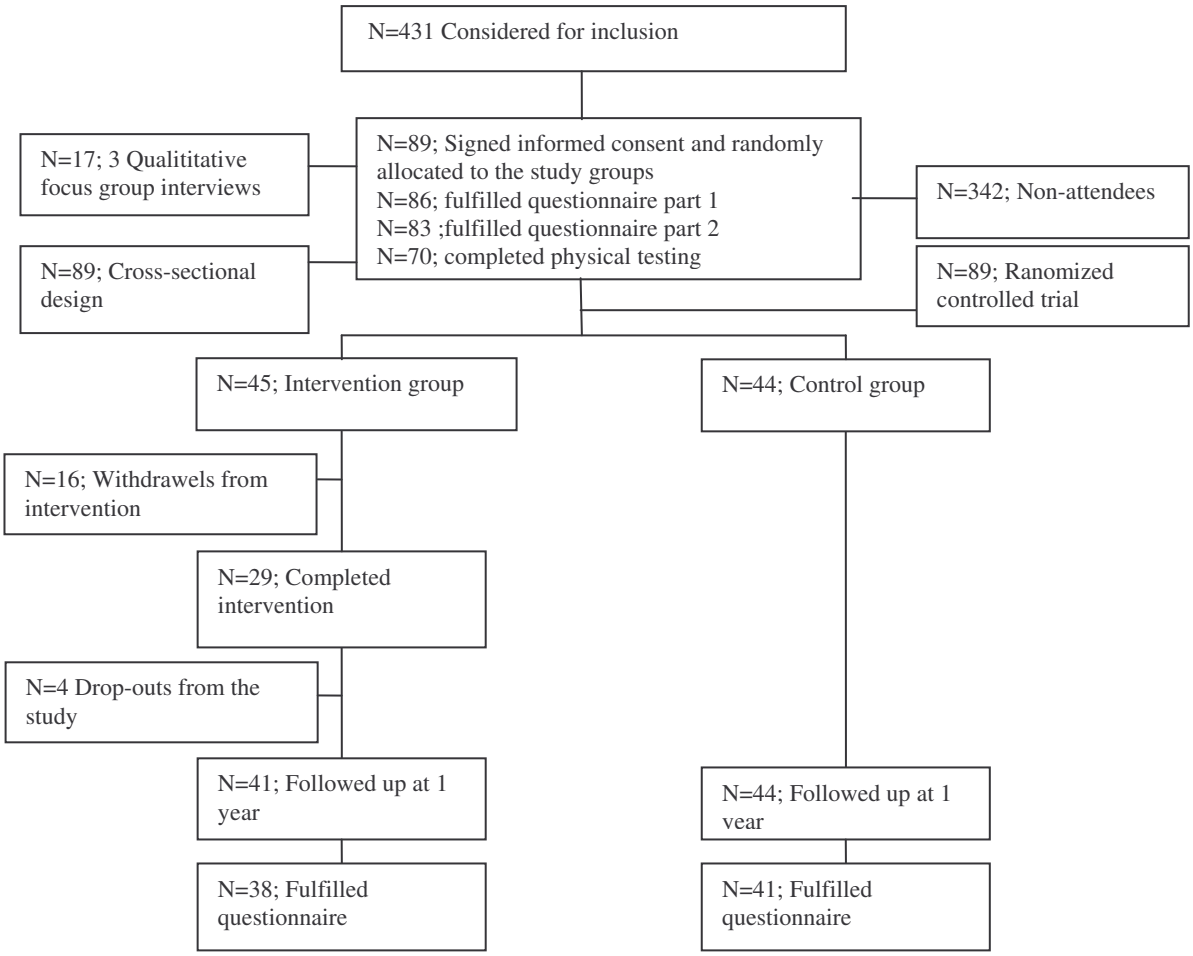

Figure 4. Study designs

6.3 Measures

Detailed description of the measures used has been given in the separate papers (1-3). However, a brief overview of the measures used in the following studies is as follows:

Focus group interviews (Paper 1): A qualitative method was considered appropriate to gather information about perspectives related to barriers against returning to work as perceived by the disability pensioners themselves.

Questionnaires (Paper 2 and 3): A comprehensive battery of standardised and validated questionnaires was used to get information about socio-demographic, medical, work related, health related, pain, daily functioning and psychological data.

Physical performance measures (Paper 2): Physical performance was assessed by three measures: The Back Performance Scale (BPS) which is a sum score of five tests, related to activities of daily functioning, was used to assess activity limitation. Five tests from the UKK (President Urhu Kaleva Kekkonen) test battery was used for evaluation of musculoskeletal fitness and another test from the UKK test battery, UKK walking test, was used to assess aerobic fitness.

6.4 Intervention

The intervention consisted of 2 sessions lasting for 3 hours each, two or three days apart, and was organized in groups of 5 to 11 persons. The programme included 2 h lectures related to spinal problems, focusing on pain mechanisms and aiming to reduce fear avoidance beliefs related to activity and work. Another part of the programme involved 3 hours of motivational interviewing (Miller, 2002) aiming to help the participants to focus on their strength and capacity. They were encouraged to identify barriers for returning to work and to look for possible solutions for a successful return to work. In addition, 1 hour information by counsellors from the

social insurance office and work office was provided, and accessible options for combining health-adjusted work and disability benefit were outlined. After the group sessions the participants were offered individual follow-up by a physician and a nurse including a medical examination and assessment of their work ability. Twenty-five of 29 participants accepted the offer. They were also given appropriate motivation to consider work again. The participants who were motivated to try out for work after this intervention were followed up by a counsellor from the work office, with the aim of entering specific work-related training.

6.5 Statistics

SPSS versions 12.0 and 13.00 were used to analyse the data. Descriptive statistics were used to describe physical and mental functioning in the participants. Independent sample t-tests and Chi-square tests were used to examine continuous and categorical data, respectively (Paper 2). Expectations of return to work (dependent variable) was dichotomised with *yes* in one category (those who believed they could return to work (n=15) and *no* in the other (those who did not believe they could return to work (n=42) or those who answered “do not know” (n=27) which was considered a rather negative expectation).The relationship between physical and mental functioning and expectation was examined (Paper 2). Differences in disability benefit payments between intervention and control groups and between participants and non-attendees were examined by counting. Relative Risk (RR) for having entered a return to work process was calculated (Paper 3). Prognostic factors for having entered a

return to work process at 1-year follow-up (Paper 3) were examined by logistic regression analysis.

7. Results and summary of papers

7.1 Paper 1

Barriers against returning to work - as perceived by disability pensioners with back pain - a focus group based qualitative study

Research aim 1: To explore the issue of perceived barriers for returning to work based on experiences and beliefs in a group of disability pensioners with back pain.

This study shed light on the many barriers that disability pensioners with long-lasting back pain perceive as obstacles for a return to work by using focus group interviews. Many of the participants pointed to conditions at their former work places that they believed contributed to the disability process, and which would make it difficult to return to work. Factors mentioned were a high demand for efficacy and productivity and hostile attitudes from superiors and colleagues. Poor self-judgement of work ability due to poor health was considered by many to be an important obstacle. Some also expressed a general lack of self-esteem and a pessimistic view of the future. Lack of support from officials and lack of modified work places were mentioned as contributing factors for not being able to return to work. Finally, insufficient economical incentives were mentioned as a de-motivating factor.

Possible solutions to these barriers included flexible job possibilities, secure and incentive economic arrangements, and an understanding and supportive attitude from all parts involved in the return to work process.

Having provided insight into perceived barriers of returning to work, the next aim was to provide knowledge of the potential working ability of the pensioners by examining their physical and mental functioning, and further to explore their expectancy for returning to work and potential individual characteristics related to expectancy and return to work.

7.2 Paper 2

Physical and mental functioning in disability pensioners with back pain

Research aim 2: To describe physical and mental functioning of a group of disability pensioners with back pain

Research aim 3: To explore whether lack of belief in returning to work was related to demographic, psychological or physical variables

Evaluation of physical and mental functioning is important when deciding who is entitled to receive DP and who is able to work (NOU, 2000). The second paper aimed to discuss the physical and mental functioning of disability pensioners with back pain, and to explore potential characteristics which could describe those who had a negative expectancy for work. Standardised and validated questionnaires and

physical performance tests were used to measure physical and mental functioning. Previous studies have demonstrated decreased functioning in patients with long-lasting back pain (Deyo et al., 1999; Strand et al., 2002; Grotle et al., 2005), but little is known regarding functioning of disability pensioners with back pain.

Substantial disability was demonstrated by all self-report and performance measures. Nearly all participants reported high levels of pain and other health complaints, and self-reported working ability was rated as low. However, a subgroup with less complaints and a more positive attitude towards work were identified: fifteen (18%) of the participants believed that they could return to work eventually. This subgroup of disability pensioners was characterised by having better physical performance and less fear avoidance for physical activities. Poor physical performance was related to not believing in a return to work. This was particularly pronounced for dynamic flexibility of the trunk (OR=13.6, 95%CI=1.59-117.38), neck and shoulder flexibility (OR=7.4, 95%CI=1.55-35.22), perceived problems with work-related function (OR=7.0, 95%CI=1.60-30.75), and high fear avoidance of physical activities (OR=6.3, 95%CI=1.15-34.17).

Paper 2 demonstrated that the pensioners had substantial disabilities. Physical performance and fear avoidance for physical activities seemed to be key factors for not expecting any return to work. Based on these findings and the perceived barriers

against returning to work (Paper 1), the next aim was to examine the if a vocational-oriented intervention would have effect on return to work or having entered a return to work process. We also aimed to identify prognostic factors for having entered a return to work process in the following year.

7.3 Paper 3

An effort to return disability pensioners with back pain to work by a brief vocational-oriented intervention

Research aim 4: To investigate the effect of a brief vocational-oriented intervention

Research aim 5: To identify prognostic factors for entering a return to work process

The last paper in this thesis dealt with examination of the effects of a brief vocational-oriented intervention, based on the findings from Paper 1 and 2. A randomised controlled trial was conducted to evaluate the effect of the intervention at 1-year follow-up. The intervention had no statistically significant effect on return to work as only 2 participants in each group had a reduction in disability payment at 1 year follow-up. The reductions ranged from 4 to 42%. However, 10 participants (22%) in the intervention group and 5 (11%) of the controls reported to have entered a process of returning to work (RR=1.96 (0.73-5.26). Even if the result did not reach statistical significance, the intervention may still be of practical and economical significance since the difference between the groups gave an Absolute Risk Reduction of 11 and the number needed to treat (NNT) was 9.

Several potential predictors for having entered a return to work process were identified. The disability pensioners who had a positive expectancy, less pain and better physical performance were more likely to having entered a return to work process. When adjusting for age and gender, fear avoidance for work (OR=10.6, 95% CI=1.5-78.1) became significant ($p<0.05$), pain (OR=5.5, 95% CI=1.1-13.6) and belief in returning to work (OR=10.5, 95% CI=2.4-44.5) showed higher odds ratios, while physical performance showed unchanged odds ratios.

8. Discussion

8.1 Perceived barriers for returning to work

Main barriers for returning to work mentioned by the pensioners were earlier negative experiences in their work life, low self-judgement of working ability, low self-esteem and organizational and economic conditions of the disability process. Concerns about own health appeared to be a key issue as most pensioners pointed to poor health as a main obstacle for returning to work. This is in concordance with findings from similar investigations (Marhold et al., 2002; Olsen et al., 2005). Main and Burton (2000) stated that barriers which generally are related with failure to return to work are associated with the person's perceptions and concerns of health and work. Moreover, our results suggest that the pensioners are concerned about economic issues in case they should try out work again. Fear of loosing benefit may discourage entering a re-employment process. Receiving only a marginal increase in income when trying out for work was pointed to as de-motivating.

Support and understanding from all parts involved in the re-employment process were regarded as important in order to risk entering vocational rehabilitation. Most of the pensioners expressed that they had low self-confidence in own abilities and skills related to work, and they were afraid of experiencing a new defeat when trying out for work again. Support and feedback have been found to increase motivation for

entering a return to work process (Gard & Sandberg, 1998). A positive assessment of own work ability has also been linked to return to work in patients on sick leave (Hagen et al., 2005; Haldorsen et al., 1998; Reiso et al., 2003). Such assessment is influenced both by perception of own health and perceived expectations from the employer. Our intervention aimed to address these issues by focusing on own resources and abilities. The pensioners also mentioned flexible and adjusted job solutions as a prerequisite for considering a return to work. When the adjustment latitude is high, it is more likely that a person regains ability to work (Johansson et al., 2006; Johansson & Lundberg, 2004).

8.2 Physical and mental functioning

The results from Paper 2 revealed that the disability pensioners had major physical and mental difficulties. The findings are in agreement with another study on unemployed individuals with long lasting back pain for more than 3 years (Watson et al., 2004), but worse than reported of functioning in patients with chronic back pain still employed (Crombez et al., 1999; Fritz & George, 2002; Fritz et al., 2001; Hagen et al., 2002). Therefore, our findings might indicate that their general health declines over time. Several authors have suggested that unemployment might lead to isolation and inactivity which in turn may aggravate physical and mental condition (Janlert, 1997; Kraut et al., 2000; Waddell, 2002a). However, since we have used a cross sectional design, we can not draw any certain conclusion.

An interesting finding was that especially the physical functioning was limited, measured by both self-report and physical performance measures. One could speculate that the disability pensioners might exaggerate their physical disability to justify their benefit. However, poor performance also of simple, light physical activity tests gives further credence to validity of the data. It is obvious that physical limitation is a serious problem for the disability pensioners, particularly in activities that require dynamic flexibility of the trunk, and may represent a major obstacle for work. Work ability has previously been found to be linked to physical factors (Lindberg et al., 2005; Tuomi et al., 1994). The relationship between physical limitations and reduced work ability was also emphasised in the focus group interviews (Paper 1). Poor self-judged work ability due to back problems was held by many as the main barrier for returning to work.

The results from Paper 2 also revealed high levels of pain, distress and fear avoidance behaviour in the pensioners. Long-standing pain and avoidance behaviour might result in withdrawal from society leading to mood disturbances, distress and frustration (Waddell et al., 1993; Vlaeyen & Linton, 2000; Pincus et al., 2002). Furthermore, pain-related fear might result in physical inactivity which in turn influences the cardiovascular and musculoskeletal system, leading to a deconditioning syndrome (Mayer et al., 1985; Kohles et al., 1990; Crombez et al., 1998). Deconditioning is associated with adaptation to a non-working status which

makes it even more difficult for the back pain disability pensioner to return to work (Waddell, 1987).

The self-rated health was considerably lower than what is reported in the general population (Ihlebaek et al., 2002). It is well known that low self-rated health is associated with increased morbidity and work retirement, and this finding adds to the impression of low work potential among these pensioners. Furthermore, a high level of co-morbidity was demonstrated. These results support earlier findings that patients with long-lasting back pain often have many other complaints as well (Hestbaek et al., 2003; Raspe et al., 2003; Von Korff et al., 2005; Hagen et al., 2006). It has been hypothesised that sensitisation may lead to a high level of subjective health complaints in patients with chronic LBP (Eriksen & Ursin, 2004).

8.3 Expectations for a return to work

In Paper 2 we found that only 18% of the participants had a positive expectancy for a future return to work. There is considerable evidence that patients' beliefs and expectations regarding recovery influence the likelihood for a future return to work (Haldorsen et al., 1998b; Mondloch et al., 2001; Cole et al., 2002; Schultz et al., 2004; Goossens et al., 2005; Boersma & Linton, 2006). The low number of pensioners with a positive attitude was to be expected considering the finding of general reduced physical and mental functioning. They reported fear that work and physical activities would harm their back (Paper2). The association between

expectancy, fear and health and is supported by a previous study (Boersma & Linton, 2006).

Many of the pensioners had previously experienced unsuccessful attempts of re-employment, which might add to the negative expectancy (Eriksen & Ursin, 2004). High demands at work and lack of flexible and adjusted work solutions were pointed out as reasons for not being able to stay at work (Paper1). Unsuccessful attempts to return to work might in turn have lead to a feeling of hopelessness in many of the pensioners (Overmier, 2002). To reach the goal of including a higher number of disability pensioners into work (Including working life, 2001), governmental agencies should stimulate the creation of modified work places, suitable for individuals with disabilities.

Interestingly, we identified a subgroup of pensioners with fewer complaints and better physical functioning than the rest, and these pensioners held a more positive expectancy. They also had less fear of physical activities in general. One would expect that this group had a better potential for rehabilitation than the pensioners with poorer physical functioning and a negative attitude towards work.

8.4 Effect of a brief vocational-oriented intervention

The brief and inexpensive vocational-oriented intervention offered in this study provided lessons about the spine and pain mechanisms, reassurance, a motivational course, and information from insurance counsellors concerning available incentives and opportunities to combine benefits and work. Even if the difference between groups was not statistically significant, twice as many in the intervention group compared to the control group reported to have entered a return to work process during the following year.

We were able to identify only one previous study in this field. Watson and co-workers (2004) reported that 38% had re-entered work and another 23% was on work training after a 6 weeks vocational-oriented intervention on unemployed individuals who were not able to access work because of LBP. However, as the study did not include a control group, general conclusions can not be drawn. European guidelines gives the following recommendations for the management of chronic LBP: Cognitive behavioural therapy, supervised exercise therapy, brief educational interventions and multidisciplinary (bio-psycho-social) treatment (Airaksinen et al., 2006, www.backpaineurope.org). Our intervention contained many of these elements, but had a briefer character and did not include physical exercises.

There might be a number of explanations why our intervention failed to give significant results. One could speculate whether the intervention was too brief and not focused enough. The pensioners expressed having low self-confidence and therefore needed very close and sustained support from all parts involved in the reactivation process (Paper 1), hence, the rehabilitation process might be more demanding and time-consuming than anticipated. There is evidence that brief interventions with information, fear reduction and light activity lead to significant reduction of sick leave (Indahl et al, 1998; Hagen et al. 2000), while extensive multidisciplinary treatment do not give such an effect in patients with subacute LBP (Haldorsen et al., 1998a). Haldorsen et al. (2002) showed that the patients on long-term sick leave with poor prognosis receiving extensive multidisciplinary treatment returned to work at a higher rate than patients receiving ordinary treatment. These findings indicate that the disability pensioners with back pain might need a more extensive treatment program than we were able to provide. Also, the pensioners perceived that their poor health was the main reason for not being able to return to work (Paper 1) supporting this notion. When planning the study, we expected that the pensioners previously had gone through extensive treatment and that further treatment would not be beneficial for this group. In Norway, a prerequisite for being granted a DP is that all appropriate medical treatments and vocational rehabilitation efforts should have been tried out (NIA, 2000). Another reason for the decision of not including further medical treatment was that such a treatment programme would be too expensive and time consuming with our resources. Whether further treatment might still be beneficial for this group of disability pensioners, remains to be seen.

Another explanation might be found in the characteristics of the participants as a group. They had been out of work for an average of 9.5 years, which in itself gives a poor prognosis (Frank et al., 1996; Hagen & Thune, 1998; Watson et al., 1998; Watson et al., 2004). This has probably lead to outdated vocational skills making re-employment difficult. Their educational level was considerably lower than for the average population of same age and gender (Ihlebaek et al., 2002). Also, general lack of expectancy for returning to work and limited physical and mental functioning (Paper 2) might give further explanation for lack of effect.

However, this modest intervention might still be cost-effective since twice as many in the intervention group reported to have entered a return to work process after 1 year, giving NNT of 9. The potential economical gain by bringing disability pensioners back to work is expected to be so large that an effort with such a result might be worth while. The study period was too short to predict if those who had entered this process would succeed in getting employed eventually. This would depend, among other things, on availability of adjusted work and willingness to employ people with reduced work ability. Therefore we believe that this intervention might be of relevance, especially if the most motivated pensioners are selected.

8.5 Prognostic factors for having entered a return to work process

The pensioners with a more positive attitude towards work, better physical functioning, less pain and less fear avoidance beliefs, were most likely to have entered a return to work process after 1 year. These factors were not identified by Watson and co-workers (2004). They found, on the other hand, that those who failed to make positive progress toward employment were characterised by longer duration of unemployment and higher scores on somatic anxiety and depression, but found no association with physical functioning and pain (Watson et al., 2004). However, our studies used different test batteries, making comparisons difficult. It is possible that our tests better reflect key aspects of activity limitations in patients with back pain than the tests used in Watson's study. Some of our tests have previously been shown to differentiate between patients who successfully returned to work one year after a 4 week multidimensional intervention and those who did not (Strand et al., 2001).

Recent reviews have pointed to a number of different prognostic factors for returning to work in patients on sick leave due to LBP. They include distress and fear avoidance beliefs (Gatchel & Gardea, 1999; Pincus et al., 2002; Crombez et al. 1999; Fritz & George, 2002), pain level (Shaw et al. 2001; Lötters et al., 2006), disability level (Smeets et al., 2004) and social and economical issues (Linton, 2000; McIntosh et al., 2000; Pincus et al., 2002), most of them in accordance with our findings. However, these studies have been conducted almost exclusively on sick-listed

individuals still employed, and may not be applicable to back pain disability pensioners.

Positive expectancy was strongly related to having entered a return to work process. This is in agreement with findings from several previous studies (Lackner & Carosella, 1999; Mondloch et al., 2001; Cole et al., 2002; Schultz et al., 2002; Boersma & Linton, 2006). Positive expectation seemed to be related to better physical functioning, less pain and fear avoidance beliefs (Paper 2 and 3). In rehabilitation efforts, it should be beneficial to select the pensioners most likely to return to work. Our study indicates that having a positive expectation for work, better physical functioning and less pain are the most important factors. The importance of selecting participants for vocational rehabilitation has been underlined elsewhere (Kool et al., 2002).

8.6 Practical implications

Since there was a close relationship between positive expectancy and having entered into a rehabilitation process, a more careful selection of participants in future rehabilitation projects could be worthwhile. One might speculate that a simple interview could disclose the necessary information about expectancy and motivation without performing more extensive testing, since there was a positive relationship between expectancy and functioning.

In Paper 1, the pensioners pointed to some important prerequisites for a successful return: sufficient support, suitable work places and economical incentives. Facilitation of these factors would be a Governmental responsibility, both through direct supportive measurements, and indirectly by encouraging employers to be more willing to employ individuals with less than a perfect functioning.

One could also question if it is possible to increase motivation for work. We used motivational interviewing (Miller, 2002), and emphasised perceived recourses and barriers to encourage return to work. Addressing these issues may be effective in increasing motivation for work. Our study did not give a clear answer to this question, but we believe that a more profound and sustained intervention is needed.

8.7 Methodological considerations

The methodological problem in this thesis is the low response rate as only 21% of the invited pensioners volunteered, and thereby we can not generalize the results to all individuals who receive DP due to LBP. Non-participation in epidemiological studies has the potential to introduce bias into the result of such studies (Jacomb et al., 2002), and this may also be true in our study. We had only access to demographic data on the non-responders; otherwise we know nothing about them. This, of course, questions how representative the data really are. According to gender, age and

number of years receiving disability benefit, the non-responders were very similar to the study sample. Other researchers have come to the opposite conclusion. Non-responders are usually older, more often male, of lower socioeconomic status and have less education (Romans-Clarkson et al., 1988; Jay et al., 1993; van Heuvelen et al., 2005). Others have suggested that the participants tend to be more functionally and physically active (van Heuvelen et al., 2005) and have better health compared to non-responders (Macera et al., 1990; McCamish-Svensson et al., 1999). Some claimants may not attend medical examination because they fear being found fit for work and thereby loosing their benefit (Ford & Ford, 2000).

It is very difficult to make absolute statements about response bias in our material and the only information of the non-responders we have got showed that there were no differences in demographic variables between participants and non-responders. The low response rate is probably also an indication of the low work potential in disability pensioners. It can be concluded, though, that the study group is highly selected, and therefore the results might not be replicable in other groups of back pain disability pensioners.

In cross sectional studies causal factors and associations can only be suggested, thus the results in Paper 2 on characteristics likely to influence the expectation of returning to work, are associations, not causal relations. Due to few observations it

was not possible to make a prognostic model in a multivariate stepwise analysis in Paper 3. Large confidence intervals of the odds ratios lead to a great amount of uncertainty when interpreting the results. The odds ratios might therefore be artificially high. A strength with our study is the RCT design of the intervention study. As far as we know, this is the first study using this design in rehabilitation efforts in disability pensioners.

9. Conclusions

- The disability pensioners themselves perceived that earlier negative experiences in their work life, low self-judgement of working ability, low self-esteem and organizational and economic conditions of the disability process were barriers against work.
- Considerable physical limitation, emotional distress, pain and reduced health in general were demonstrated in this group of disability pensioners. A minority believed that they could return to work eventually. Lack of belief was related to poor physical and work-related function, and to high levels of fear avoidance for physical activities.
- The brief vocational-oriented intervention did not have a statistically significant effect on return to work or having entered into a process of return to work. However, twice as many in the intervention group reported to have entered a process of return to work compared to the controls. These individuals were characterised by a more positive attitude towards work, less physical limitations, less pain and less fear avoidance beliefs.
- This thesis supports previous suggestions that returning disability pensioners to work is, in general, a difficult task. However, the vocational intervention offered in this study might still be cost-effective if carefully selecting participants most likely to succeed.

References

Acheson D. Inequalities in health. Report on inequalities in health did give priority for steps to be tackled. BMJ 1998;317:1659.

Adams N. Psychosocial factors affecting pain. In: N Adams, ed. *The Psychophysiology of Low Back Pain*. Edinbourgh: Chrurchill livingstone, 1997:55-67.

Airaksinen O, Brox JI, Cedraschi C, Hildebrandt J, Klaber-Moffet J, Kovacs F, et al. Chapter 4. European guidelines for the management of chronic nonspecific low back pain. Eur Spine J 2006;15 Suppl 2:S192-300.

Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychol Rev 1977;84:191-215.

Boersma K, Linton SJ. Expectancy, fear and pain in the prediction of chronic pain and disability: A prospective analysis. Eur J Pain 2006;10:551-557.

Bortz WM. The disuse syndrome. The Western Journal of Medicine 1984;141:691-694.

Brady S, Mayer T, Gatchel R. Physical progress and residual impairment quantification after functional restoration. Part II: Isokinetic trunk strength. Spine 1994;19:395-400.

Brage S. Korsryggsmerter- folkehelse, trygd og økonomi (Low back pain - public health, insurance and economy). In: EW Brage S., ed. *Korsryggsmerter- en samfunnsmedisinsk og allmennmedisinsk utfordring (Low back pain - a sociomedical and general medical challenge*. Oslo: Unipub forlag, 2000:164.

Brage S, Fleten N, Knudsrod OG, Reiso H, Ryen A. [Norwegian Functional Scale- a new instrument in sickness certification and disability assessments]. Tidsskr Nor Laegeforen 2004;124:2472-2474.

Brage S, Krohg M, Klockars M, Michaelson B, Permin H, Thorlacius S. [Health and social insurance in Nordic countries]. Tidsskr Nor Laegeforen 2002;122:1486-1491.

Brosschot JF. Cognitive-emotional sensitization and somatic health complaints. Scand J Psychol 2002;43:113-121.

Brox JI, Sørensen R, Friis A, Nygaard Ø, Indahl A, Keller A, et al. Randomized clinical trial of lumbar instrumented fusion and cognitive intervention and exercises in patients with chronic low back pain and disc degenration. Spine 2003;28:1913-1921.

Bruusgaard D, Brage S. Hva har trygd med medisin å gjøre? belyst ved eksempelet kroniske, utbredte muskelsmerter. I Bay AH, Hvinden B & Koren C (red). Virker velferdsstaten? Kristiansand, Høgskoleforlaget, 2001:198-213,

Burton AK, Balagué FF, Cardon GG, Erisken HR, Henrotin YY, Lahad AA, et al. How to prevent low back pain. 2005;19:541-555.

Claussen B, Bjerkedal T. [Applications for disability benefits before and after the 1991 restrictions]. Tidsskr Nor Laegeforen 1999;119:2182-2186.

Clauw DJ, Williams D, Lauerman W, Dahlman, M, Aslami A, Nachemson AL,et al. Pain sensitivity as a correlate of clinical status in individuals with chronic low back pain. Spine 1999;24:2035-2041.

Cole DC, Mondloch MV, Hogg-Johnson S. Listening to injured workers: how recovery expectations predict outcomes-a prospective study. Cmaj 2002;166:749-754.

Crombez G, Vervaet L, Lysens R, Baeyens F, Eelen P. Avoidance and confrontation of painful, back-straining movements in chronic back pain patients. Behav Modif 1998;22:62-77.

Crombez G, Vlaeyen JW, Heuts PH, Lysens R. Pain-related fear is more disabling than pain itself: evidence on the role of pain-related fear in chronic back pain disability. Pain 1999;80:329-339.

Deyo RA, Battie M, Beurskens AJ, Bombardier C, Croft P, Koes B, et al. Outcome measures for low back pain research. A proposal for standardized use [published erratum appears in Spine 1998 Feb 15;24:418]. Spine 1998;23:2003-2013.

Engebers M, Veiersted B. Rapport fra en ekspertkonferanse om funksjonsvurdering 27.-28.januar 2003. [Report from a conscensus meeting concerning functional

assessments 27th to 28th of January 2003] Stami-rapport No 4;2003, Statens arbeidsmiljøinstitutt. (In Norwegian)

Eriksen HR, Ursin H. Subjective health complaints, sensitization, and sustained cognitive activation (stress). J Psychosom Res 2004;56:445-448.

Ford FM, Ford JJ. Non-attendance for Social Security medical examination: patients who cannot afford to get better? Occupational medicine 2000;50:504-507.

Frank JW, Brooker AS, DeMaio SE, Kerr MS, Maetzel A, Shannon HS, et al. Disability resulting from occupational low back pain. Part II: What do we know about secondary prevention? A review of the scientific evidence on prevention after disability begins. Spine 1996;21:2918-2929.

Fritz JM, George SZ. Identifying psychosocial variables in patients with acute work-related low back pain: the importance of fear-avoidance beliefs. Phys Ther 2002;82:973-983.

Fritz JM, George SZ, Delitto A. The role of fear-avoidance beliefs in acute low back pain: relationships with current and future disability and work status. Pain 2001;94:7-15.

Fryer GG, Morris TT, Gibbons PP. Paraspinal muscles and intervertebral dysfunction: part two. Journal of manipulative and physiological therapeutics 2004;27:348-357.

Gard G, Sandberg AC. Motivating factors for return to work. Physiother Res Int 1998;3:100-108.

Gatchel RJ, Gardea MA.Psychosocial issues:their importance in predicting disability response to treatment, and search for compensation. Neurol Clin 1999;17:149-66

Gjesdal S, Ringdal PR, Haug K, Maeland JG. Predictors of disability pension in long-term sickness absence: results from a population-based and prospective study in Norway 1994-1999. Eur J Public Health 2004;14:398-405.

Glad K. Eldrebølgen slår lenger inn over Europa enn Norge: Statistics Norway, 2003.

Goossens ME, Vlaeyen JW, Hidding A, Kole-Snijders A, Evers SM. Treatment expectancy affects the outcome of cognitive-behavioral interventions in chronic pain. Clin J Pain 2005;21:18-26; discussion 69-72.

Gross DP, Battie MC. Work-related recovery expectations and the prognosis of chronic low back pain within a workers' compensation setting. J Occup Environ Med 2005;47:428-433.

Grotle M, Brox JI,Vollestad NK. Functional status and disability questionnaires: what do they assess? A systematic review of back-specific outcome questionnaires. Spine 2005;30:130-140.

Guberan E,Usel M. Permanent work incapacity, mortality and survival without work incapacity among occupations and social classes: a cohort study of ageing men in Geneva. Int J Epidemiol 1998;27:1026-1032.

Guzman J, Esmail R, Karjalainen K, Malmivaara A, Irvin E, Bombardier C. Multidisciplinary rehabilitation for chronic low back pain: systematic review. BMJ 2001;322:1511-1516.

Hadler NNM. The disabled, the disallowed, the disaffected and the disavowed. Journal of occupational and environmental medicine 1996;38(3):247-251.

Hagen EM, Svensen E, Eriksen HR, Ihlebaek CM, Ursin H. Comorbid subjective health complaints in low back pain. Spine 2006;31:1491-1495.

Hagen EM, Svensen E, Eriksen HR. Predictors and modifiers of treatment effect influencing sick leave in subacute low back pain patients. Spine 2005;30:2717-2723.

Hagen KB, Holte H, Tambs K, Bjerkedal T. Socioeconomic factors and disability retirement from back pain: a 1983-1993 population-based prospective study in Norway. Spine 2000;25:2480-2487.

Hagen KB, Tambs K, Bjerkedal T. A prospective cohort study of risk factors for disability retirement because of back pain in the general working population. Spine 2002;27:1790-1796.

Hagen KB, Thune O. Work incapacity from low back pain in the general population. Spine 1998;23:2091-2095.

Haldorsen EM, Indahl A, Ursin H. Patients with low back pain not returning to work. A 12-month follow-up study. Spine 1998;23:1202-1207.

Haldorsen EM, Kronholm K, Skouen JS, Ursin H. Multimodal cognitive behavioral treatment of patients sicklisted for musculoskeletal pain: a randomized controlled study. Scand J Rheumatol. 1998a;27:16-25.

Haldorsen EM, Kronholm K, Skouen JS, Ursin H. Predictors for outcome of a multi-modal cognitive behavioural treatment program for low back pain patients-a 12-month follow-up study. Eur J Pain 1998b;2:293-307.

Haldorsen EM, Grasdal AL, Skouen JS, Risa AE, Kronholm K, Ursin H. Is there a right treatment for a particular patient group? Comparison of ordinary treatment, light multidiciplinary treatment and extensive multidiciplinary treatment for long-term sick-listed employees with musculoskeletal pain. Pain 2002;95:49-63

Hansson M, Bostrom C, Harms-Ringdahl K. Living with spine-related pain in a changing society--a qualitative study. Disabil Rehabil 2001;23:286-295.

Hansson TT, Jensen II. Swedish Council on Technology Assessment in Health Care (SBU). Chapter 6. Sickness absence due to back and neck disorders. Scandinavian journal of public health. Supplement 2004;63:109-151.

Hestbaek L, Leboeuf-Yde C, Manniche C. Is low back pain part of a general health pattern or is it a separate and distinctive entity? A critical literature review of comorbidity with low back pain. J Manipulative Physiol Ther 2003;26:243-252.

Hoogendoorn WE, van Poppel MN, Bongers PM, Koes BW, Bouter LM. Systematic review of psychosocial factors at work and private life as risk factors for back pain [In Process Citation]. Spine 2000;25:2114-2125.

Ihlebaek C, Eriksen HR, Ursin H. Prevalence of subjective health complaints (SHC) in Norway. Scand J Public Health 2002;30:20-29.

Ilmarinen J, Rantanen J. Promotion of work ability during ageing. Am J Ind Med 1999;Suppl 1:21-23.

Including working life [Inkluderende arbeidsliv]: Intensjonsavtale 3.oktober 2001. Available at: http://www.trygdeetaten.no/Arbeidsliv/pdf/intensjonsavtale.pdf (11.11.2003) (In Norwegian)

Jacomb PA, Jorm AF, Korten AE, Christensen H, Henderson AS. Predictors of refusal to participate: a longitudinal health survey of the elderly in Australia. BMC Public Health 2002;2:4.

Janlert U. Unemployment as a disease and diseases of the unemployed. Scand J Work Environ Health 1997;23 Suppl 3:79-83.

Jay GM, Liang J, Liu X, Sugisawa H. Patterns of nonresponse in a national survey of elderly Japanese. J Gerontol 1993;48:S143-152.

Johansson G, Lundberg O, Lundberg I. Return to work and adjustment latitude among employees on long-term sickness absence. Journal of occupational rehabilitation 2006.

Johansson GG, Lundberg II. Adjustment latitude and attendance requirements as determinants of sickness absence or attendance. Empirical tests of the illness flexibility model. Social science & medicine 2004;58:1857-1868.

Kohles S, Barnes D, Gatchel R, Mayer TG. Improved physical performance outcomes after functional restoration treatment in patients with chronic low-back pain. Early versus recent training results. Spine 1990;15:1321-1324.

Kohlmann T, Raspe H. Die patientennahe Diagnostik von Functionseinschränkungen im Alltag. Psychomed 1994;6:21-27.

Kool JP, Oesch PR, de Bie RA. Predictive tests for non-return to work in patients with chronic low back pain. Eur Spine J 2002;11:258-266.

Kraut A, Mustard C, Walld R, Tate R. Unemployment and health care utilization. Scand J Work Environ Health 2000;26:169-177.

Krokstad S, Johnsen R, Westin S. [Medical and non-medical risk factor criteria for disability pension]. Tidsskr Nor Laegeforen 2002a;122:1479-1485.

Krokstad S, Johnsen R, Westin S. Social determinants of disability pension: a 10-year follow-up of 62 000 people in a Norwegian county population. Int J Epidemiol 2002b;31:1183-1191.

Krokstad S, Westin S. Disability in society : medical and non-medical determinants for disability pension in a Norwegian total county population study. [Oxford]: Pergamon, 2004.

Kvåle G, Olsen TS, Jentoft N. Evaluering av trygdeetatens og Aetats arbeid med å få uføre tilbake til arbeid. FOU Rapport, Sammendrag. Kristiansand: Agderforskning 2005. (In Norwegian)

Lackner JM, Carosella AM. The relative influence of perceived pain control, anxiety, and functional self efficacy on spinal function among patients with chronic low back pain. Spine 1999;24:2254-2260; discussion 2260-2251.

Lindberg P, Vingård E, Josephson M, Alfredsson L. Retaining the ability to work-associated factors at work*. The European journal of public health 2005.

Linton SJ. A review of psychological risk factors in back and neck pain. Spine 2000;25:1148-1156.

Lötters FF, Burdorf AA, Kuiper JJ, Miedema H. Model for the work-relatedness of low-back pain. Scandinavian journal of work, environment & health 2003;29:431-440.

Macera CA, Jackson KL, Davis DR, Kronenfeld JJ, Blair SN. Patterns of non-response to a mail survey. J Clin Epidemiol 1990;43:1427-1430.

Mackenbach JP, Borsboom GJ, Nusselder WJ, Looman CW, Schrijvers CT. Determinants of levels and changes of physical functioning in chronically ill persons: results from the GLOBE Study. J Epidemiol Community Health 2001;55:631-638.

Magnussen L, Rognsvag T, Tveito TH, Eriksen HR. Effect of a Brief Cognitive Training Programme in Patients with Long-lasting Back Pain Evaluated as Unfit for Surgery. J Health Psychol 2005;10:233-243.

Main CJ, Burton AK. Economic and occupational influences on pain and disability. In: CJ Main, Spanswick, CC., ed. *Pain management: an interdiciplinary approach*. Edinburgh: Churchill Livingstone, 2000:63-87.

Mansson NO, Rastam L, Eriksson KF, Israelson B. Socioeconomic inequalities and disability pension in middle-aged men. Int J Epidemiol 1998;27:1019-1025.

Marhold C, Linton SJ, Melin L. Identification of obstacles for chronic pain patients to return to work: evaluation of a questionnaire. J Occup Rehabil 2002;12:65-75.

Mayer TG, Gatchel R, Kishino N, Keeley J, Capra P, Mayer H, et al. Objective assessment of spine function following industrial injury. A prospective study with comparison group and one-year follow-up. Spine 1985;10:482-493.

Mayer TG, Gatchel RJ. Functional restoration of spinal disorders: the sports medicine approach. Philadelphia: Lea & Febiger, 1988.

McCamish-Svensson C, Samuelsson G, Hagberg B, Svensson T, Dehlin O. Social relationships and health as predictors of life satisfaction in advanced old age: results from a Swedish longitudinal study. Int J Aging Hum Dev 1999;48:301-324.

McIntosh G, Frank J, Hogg-Johnson S, Bombardier C, Hall H. Prognostic factors for time receiving workers' compensation benefits in a cohort of patients with low back pain. Spine 2000;25:147-157.

Miller WR. Motivational Interviewing; preparing people for change. New York: New York: Guilford Press, 2002.

Mondloch MV, Cole DC,Frank JW. Does how you do depend on how you think you'll do? A systematic review of the evidence for a relation between patients' recovery expectations and health outcomes. Cmaj 2001;165:174-179.

Morris JK, Cook DG, Shaper AG. Loss of employment and mortality. Bmj 1994;308:1135-1139.

Natvig B, Eriksen W,Bruusgaard D. Low back pain as a predictor of long-term work disability. Scand J Public Health 2002;30:288-292.

NIA. Trygdestatistisk årbok (Statistical Yearbook of Social Insurance 2005): Rikstrygdeverket (National Insurance Administration), 2005.

NIA. The Norwegian Social Insurnace Scheme. Oslo, 2005. Available at: http://rundskriv.trygdeetaten.no/rtv/lpext.dll?f=templates&fn=main-j.htm

NOU. Sykefravær og uførepensjonering. Et inkluderende arbeidsliv [Sickness absence and disability pension, an including working life]. NOU No.27;2000. Available at: www.dep.no/sos/norsk/publ/utredninger/NOU/ (08.07.03) (In Norwegian)

Nylen L, Voss M, Floderus B. Mortality among women and men relative to unemployment, part time work, overtime work, and extra work: a study based on data from the Swedish twin registry. Occup Environ Med 2001;58:52-57.

OECD. Transforming Disability into Ability: Policies to Promote Work and Income Security for Disabled People (Complete Edition - ISBN 9264198873).2: OECD 2003.

Olsen TS, Kvåle G, Jentoft N. Mellom trygd og arbeid. Motivasjon og risiko i uføres betraktninger om å gå tilbake til arbeidslivet. FOU rapport nr. 1/2005.Kristiansand: Agderforskning 2005. (In Norwegian)

Pearce JJM. Aspects of the failed back syndrome: role of litigation. Spinal cord 2000;38:63-70.

Picavet HS, Schuit AJ. Physical inactivity: a risk factor for low back pain in the general population? Journal of epidemiology and community health 2003;57:517-518.

Pincus T, Burton AK, Vogel S, Field AP. A systematic review of psychological factors as predictors of chronicity/disability in prospective cohorts of low back pain. Spine 2002;27:E109-120.

Raspe A, Matthis C, Heon-Klin V, Raspe H. [Chronic back pain: more than pain in the back. Findings of a regional survey among insurees of a workers pension insurance fund]. Rehabilitation (Stuttg) 2003;42:195-203.

Reiso H, Nygard J, Jorgensen G, Holanger R, Soldal D, Bruusgaard D. Back to Work: Predictors of Return to Work Among Patients With Back Disorders Certified As Sick: A Two-Year Follow-up Study. Spine 2003;28:1468-1473.

Roland M, Morris R: A study of the natural history of back pain. Part I: development of a reliable and sensitive measure of disability in low-back pain. Spine 1983;8: 141-144.

Romans-Clarkson SE, Walton VA, Herbison GP, Mullen PE. A study of women who refused to participate in a community survey of psychiatric disorder. Aust N Z J Psychiatry 1988;22:19-29.

Schultz IZ, Crook J, Meloche GR, Berkowitz J, Milner R, Zuberbier OA, et al. Psychosocial factors predictive of occupational low back disability: towards development of a return-to-work model. Pain 2004;107:77-85.

Schultz IZ, Crook JM, Berkowitz J, Meloche GR, Milner R, Zuberbier OA, et al. Biopsychosocial multivariate predictive model of occupational low back disability. Spine 2002;27:2720-2725.

Simmonds MJ, Olson SL, Jones S, Hussein T, Lee CE, Novy D, et al. Psychometric characteristics and clinical usefulness of physical performance tests in patients with low back pain. Spine 1998;23:2412-2421.

Smeets RJ, Wittink H, Hidding A, Knottnerus JA. Do patients with chronic low back pain have a lower level of aerobic fitness than healthy controls?: are pain, disability, fear of injury, working status, or level of leisure time activity associated with the difference in aerobic fitness level? Spine 2006;31:90-97; discussion 98.

Steenstra IA, Verbeek JH, Heymans MW, Bongers PM. Prognostic factors for duration of sick leave in patients sick listed with acute low back pain: a systematic review of the literature. Occup Environ Med 2005;62:851-860.

Strand LI, Ljunggren AE, Haldorsen EM, Espehaug B. The Impact of Physical Function and Pain on Work Status at 1-Year Follow-up in Patients With Back Pain. Spine 2001;26:800-808.

Strand LI, Moe-Nilssen R, Ljunggren AE. Back Performance Scale for the assessment of mobility-related activities in people with back pain. Phys Ther 2002;82:1213-1223.

Thomas JC, Hersen M. Mental Health in the Workplace: International Labour Office 2002.

Thornton P. International research project on job retention and return to work strategies for disabled workers.Geneva: International Labour Office 1998.

Trainor TJ, Trainor MA. Etiology of low back pain in athletes. Current sports medicine reports 2004;3:41-46.

Tuomi KK, Ilmarinen J, Jahkola A, Katajarinne L, Tulkki A. Work Ability Index. Helsinki: Institute of Occupational Health, 1994.

Tveito TH, Hysing M, Eriksen HR. Low back pain interventions at the workplace: a systematic literature review. Occup Med (Lond) 2004;54:3-13.

Ursin H, Eriksen HR. The cognitive activation theory of stress. Psychoneuroendocrinology 2004;29:567-592.

Vaeroy H, Helle R, Forre O, Kass E, Terenius L. Elevated CSF levels of substance P and high incidence of Raynaud phenomenon in patients with fibromyalgia: new features for diagnosis. Pain 1988;32:21-26.

van den Hoogen HJ, Koes BW, van Eijk JT, Bouter LM, Deville W. Pain and health status of primary care patients with low back pain. J Fam Pract 1997;44:187-192.

van der Giezen AM, Bouter LM, Nijhuis FJ. Prediction of return-to-work of low back pain patients sick-listed for 3-4 months. Pain 2000;87:285-294.

van der Hulst M, Vollenbroek-Hutten MR, Ijzerman MJ, Maarten J. A systematic review of sociodemographic, physical, and psychological predictors of multidisciplinary rehabilitation-or, back school treatment outcome in patients with chronic low back pain. Spine 2005;30:813-825.

van Heuvelen MJ, Hochstenbach JB, Brouwer WH, de Greef MH, Zijlstra GA, van Jaarsveld E, et al. Differences between participants and non-participants in an RCT on physical activity and psychological interventions for older persons. Aging Clin Exp Res 2005;17:236-245.

Verbunt JA, Seelen HA, Vlaeyen JW, Bousema EJ, van der Heijden GJ, Heuts PH, et al. Pain-related factors contributing to muscle inhibition in patients with chronic low back pain: an experimental investigation based on superimposed electrical stimulation. Clin J Pain 2005;21:232-240.

Vlaeyen JW, Linton SJ. Fear-avoidance and its consequences in chronic musculoskeletal pain: a state of the art. Pain 2000;85:317-332.

Vlaeyen JW, Kole-Snijders AM, Boeren RG, van Eek H. Fear of movement/(re)injury in chronic low back pain and its relation to behavioral performance. Pain 1995;62:363-372.

Von Korff M, Crane P, Lane M, Miglioretti DL, Simon G, Saunders K, et al. Chronic spinal pain and physical-mental comorbidity in the United States: results from the national comorbidity survey replication. Pain 2005;113:331-339.

Voss M, Nylen L, Floderus B, Diderichsen F, Terry PD. Unemployment and early cause-specific mortality: a study based on the Swedish twin registry. Am J Public Health 2004;94:2155-2161.

Waddell G. 1987 Volvo award in clinical sciences. A new clinical model for the treatment of low-back pain. Spine 1987;12:632-644.

Waddell G. Models of disability : using low back pain as an example: Royal Society of Medicine Press, 2002a.

Waddell G. The back pain revolution, Second edition edn. Edinborough: Curchill Livingstone, 2004a.

Waddell G. The biopsychosocial model. In: Waddell G, ed. *The back pain revolution*. 2 edn. Edinbourgh: Churchill Livingstone, 2004b:266-282.

Waddell G. Emotions. In: Waddell G, ed. *The back pain revolution*. 2 edn. Edinbourgh: Churchill Livingstone, 2004c:205-219.

Waddell G. Pain and disability. In: Waddell G, ed. *The back pain revolution*. 2 edn. Edinburgh: Churchill Livingstone, 2004d:27-45.

Waddell G, Aylward M, Sawney P. Back pain, incapacity for work, and social security benefits: an international review and analysis. London: Royal Society of Medicine Press, 2002b.

Waddell G, Burton AK. Concepts of rehabilitation for the management of low back pain. Best Pract Res Clin Rheumatol 2005;19:655-670.

Waddell G, Newton M, Henderson I, Somerville D, Main CJ. A Fear-Avoidance Beliefs Questionnaire (FABQ) and the role of fear- avoidance beliefs in chronic low back pain and disability. Pain 1993;52:157-168.

Watson PJ, Booker CK, Moores L, Main CJ. Returning the chronically unemployed with low back pain to employment. Eur J Pain 2004;8:359-369.

Watson PJ, Main CJ, Waddell G, Gales TF, Purcell Jones G. Medically certified work loss, recurrence and costs of wage compensation for back pain: a follow-up study of the working population of Jersey. Br.J.Rheumatol. 1998;37:82-86.

WHO. International classification of functioning, disability and Health, ICIDH-2. Geneva: World Health Organization, 2001.

www.backpaineurope.org

Papers 1-3